NRCS Natural Resources Conservation Service

United States Department of Agriculture

Washington Water Supply Outlook Report April 1, 2022

Aerial image of Diablo Dam on Skagit River near Newhalem, WA. A sure sign of early spring runoff when dam operators are asked to spill water, 4/1/2022. Snowpack in the Skagit Basin is currently 90% of the long-term median. Photo credit to Keith Kingslien, Elite Productions.

Water Supply Outlook Reports
and
Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

Local Natural Resources Conservation Service Field Office

or

Scott Pattee
Water Supply Specialist
Natural Resources Conservation Service
2005 E. College Way, Suite 203
Mt. Vernon, WA 98273-2873
(360) 488-4826

or

Larry Johnson
State Conservation Engineer
Natural Resources Conservation Service
11707 E. Sprague Ave., Suite 301
Spokane Valley, WA 99206
(509) 323-2955

How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk, they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

Washington
Water Supply Outlook

April 2022

General Outlook

What happened to our miracle March and La Nina, you may ask? Well, the warm dry trend from January and February continued through March. There were only 3-4 significant periods where average temperatures were cold enough for snow accumulation. Otherwise, most days remained above freezing which caused the snowpack to mature and, in most cases, peak 1-3 weeks early. April started out wet with substantial mountain snow however initial indications are that the moisture content was not significant enough to add much to the overall snowpack except at the highest elevations. Snowmelt is well under way in most east side and lower elevation west side basins.

The most recent forecast through next week indicates below normal temperatures with above normal precipitation. Climate Prediction Center 3-month (Apr-May-Jun) forecast continues the previous track of below normal temperatures with equal chances of seasonal precipitation which is indicative of the forecasted Enso La Nina. The US Drought Monitor indicates the continuation of D0-D3 drought designation carried over from last year in eastern Washington. (See maps on page 4)

Snowpack

The April 1 statewide SNOTEL readings were 80% of normal. The lowest readings in the state were at 5% of the 30-year median for April 1 in the Status Creek Basin. The Puyallup River Basin had the most snow with 126%. Westside medians from SNOTEL included the North Puget Sound River basin with 95% of normal, the Central and South Puget River basins with 87% and 82% respectively, and the Lower Columbia basins with 83% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 64% and the Wenatchee area with 80%. Snowpack in the Spokane River Basin was at 83% and the Upper Columbia River basins had 78% of the long-term median.

BASIN	PERCENT OF MEDIAN	LAST YEAR PERCENT MEDIAN
Spokane	83	102
Newman Lake	70	114
Lower Pend Oreille	83	93
Kettle	77	106
Omak	39	101
Methow	81	109
Conconully Lake	42	94
Central Columbia	80	119
Upper Yakima	79	130
Naches	76	114
Ahtanum Creek	56	111
Walla Walla	74	132
Lower Snake	67	118
Cowlitz	82	126
Lewis	82	129
White	80	118
Green	80	141
Puyallup	95	139
Cedar	83	136
Skykomish	93	153
Skagit	90	108
Nooksack	74	118
Olympic Peninsula	71	126

Precipitation

April precipitation accumulation was below normal in all but the Central and South Puget Sound basins. Statewide water-year average was 106% of average as of April 1. Monthly precipitation ranged from a high of 96% of normal in the Tolt and Skykomish basins to a low of 20% in the Entiat Basin. Some individual site reporting's for the month include Pope Ridge 20% of normal, Dungeness 22%, Lost Horse 21%, Yakima Airport 19%, Winthrop 26% and Forks 70%. SNOTEL collects all form of precipitation including, rain, snow, sleet and hail.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	84	96
Lower Pend Oreille	76	99
Upper Columbia	59	103
Central Columbia	61	103
Upper Yakima	70	99
Naches	64	99
Lower Yakima	34	86
Klickitat	44	93
Walla Walla	57	86
Lower Snake	57	82
Lower Columbia	72	107
South Puget Sound	83	103
Central Puget Sound	96	110
North Puget Sound	82	111
Olympic Peninsula	45	103

Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. April 1 Reservoir storage in the Yakima Basin was 126% of average for the Upper Reaches and 127% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 203,100-acre feet, 132% of normal and 85% of capacity; and Ross Lake within the Skagit River Basin at 102% of normal and 64% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	85	132
Lower Pend Oreille	38	78
Upper Columbia	41	57
Central Columbia	43	128
Upper Yakima	86	126
Naches	92	127
Lower Snake	61	124
North Puget Sound	64	105
South Puget Sound		119

For more information contact your local Natural Resources Conservation Service office.

Streamflow

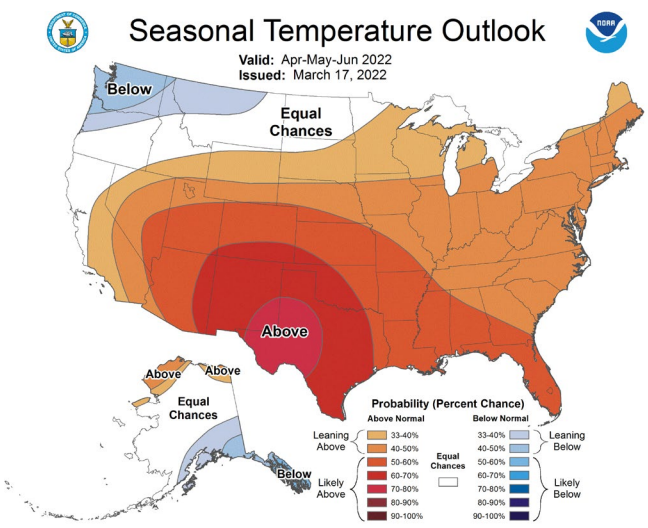
Early winter forecasts for April-September stream flows are never quite as robust as they are later in the season when we know more about the winter climatology. At times only a few degrees warmer or cooler than forecasted can make or break stream flow predictions. Volumetric forecasts are developed using current, historic and median snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions since governing conditions are likely to change for the better or the worse.

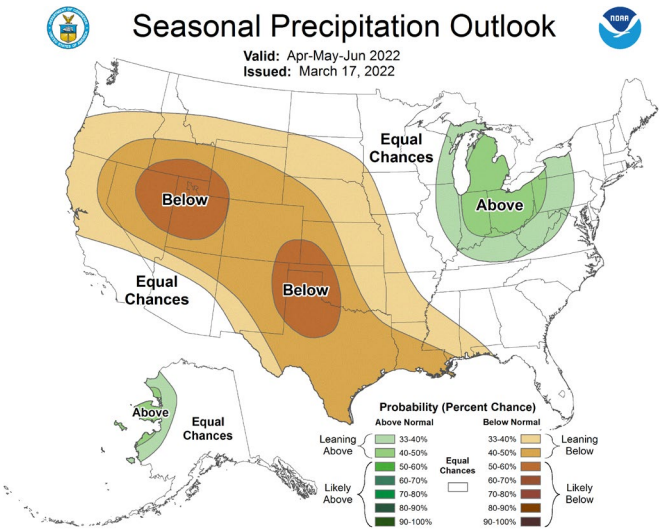
BASIN	PERCENT OF AVERAGE FORCAST (50% CHANCE OF EXCEEDENCE)
Spokane	85-109
Lower Pend Oreille	97-106
Upper Columbia	89-112
Central Columbia	91-109
Upper Yakima	99-104
Lower Yakima	93-95
Naches	91-103
Klickitat	89-94
Lower Snake-Walla Walla	83-100
Lower Columbia	102-109
South Puget Sound	108-112
Central Puget Sound	113-125
North Puget Sound	105-109
Olympic Peninsula	89-90

STREAM	PERCENT OF AVERAGE MARCH STREAMFLOWS
Priest River – near Priest River	82
Kettle at Laurier	91
Columbia at Birchbank	114
Spokane at Spokane	151
Similkameen at Nighthawk	146
Okanogan near Tonasket	92
Methow at Pateros	131
Chelan at Chelan	123
Stehekin near Stehekin	142
Wenatchee at Pashastin	141
Cle Elum near Roslyn	160
Yakima near Parker	145
Naches near Naches	188
Grande Ronde at Troy	88
Snake below Lower Granite Dam	86
Columbia River at The Dalles	98
Lewis at Merwin Dam	131
Cowlitz below Mayfield Dam	131
Skagit at Concrete	120
Dungeness near Sequim	94

For more information contact your local Natural Resources Conservation Service office.

Climate





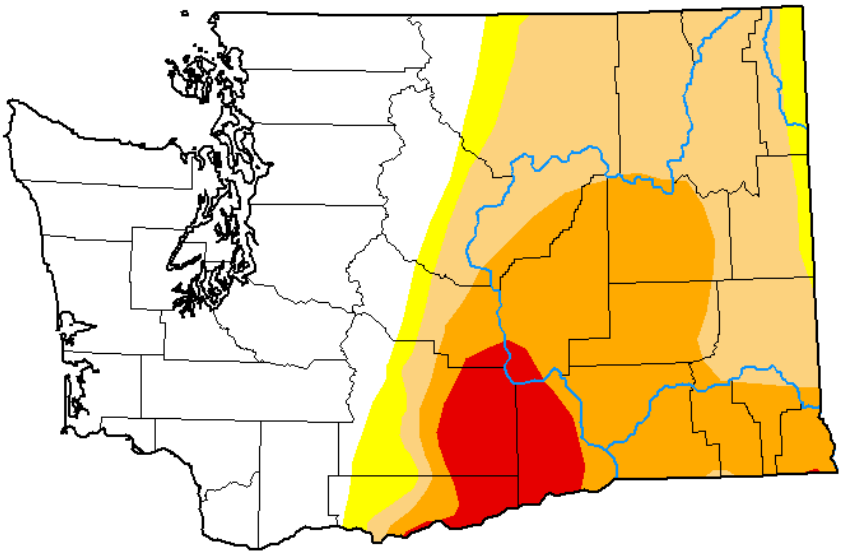
U.S. Drought Monitor

Washington

March 29, 2022

(Released Thursday, Mar. 31, 2022)

Valid 8 a.m. EDT



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

Deborah Bathke
National Drought Mitigation Center

droughtmonitor.unl.edu

Natural Resources Conservation Service

Washington State
Snow, Water and Climate Services

Program Contacts

Washington:

Roylene Comes-At-Night
State Conservationist
Spokane State Office
W. 316 Boone Ave., Suite 450
Spokane, WA 99201-2348
phone: 509-323-2961
roylene.rides-at-the-door@wa.usda.gov

Scott Pattee
Water Supply Specialist
Washington Snow Survey Office
2005 E. College Way, Suite 203
Mount Vernon, WA 98273-2873
phone: 360-488-4826
scott.pattee@wa.usda.gov

Oregon:

Scott Oviatt
Supervising Hydrologist
Oregon Data Collection Office
1201 NE Lloyd Blvd., STE 900
Portland, OR 97232
Phone: 503-414-3271
scott.oviatt@or.usda.gov

Julie Koeberle/Jolyne Lea
Forecast Hydrologist
National Water and Climate Center
1201 NE Lloyd Blvd., STE 800
Portland, OR 97232
phone: 503-414-3035/3040
julie.koeberle@usda.gov
jolyne.lea@usda.gov

Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/

Oregon:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/

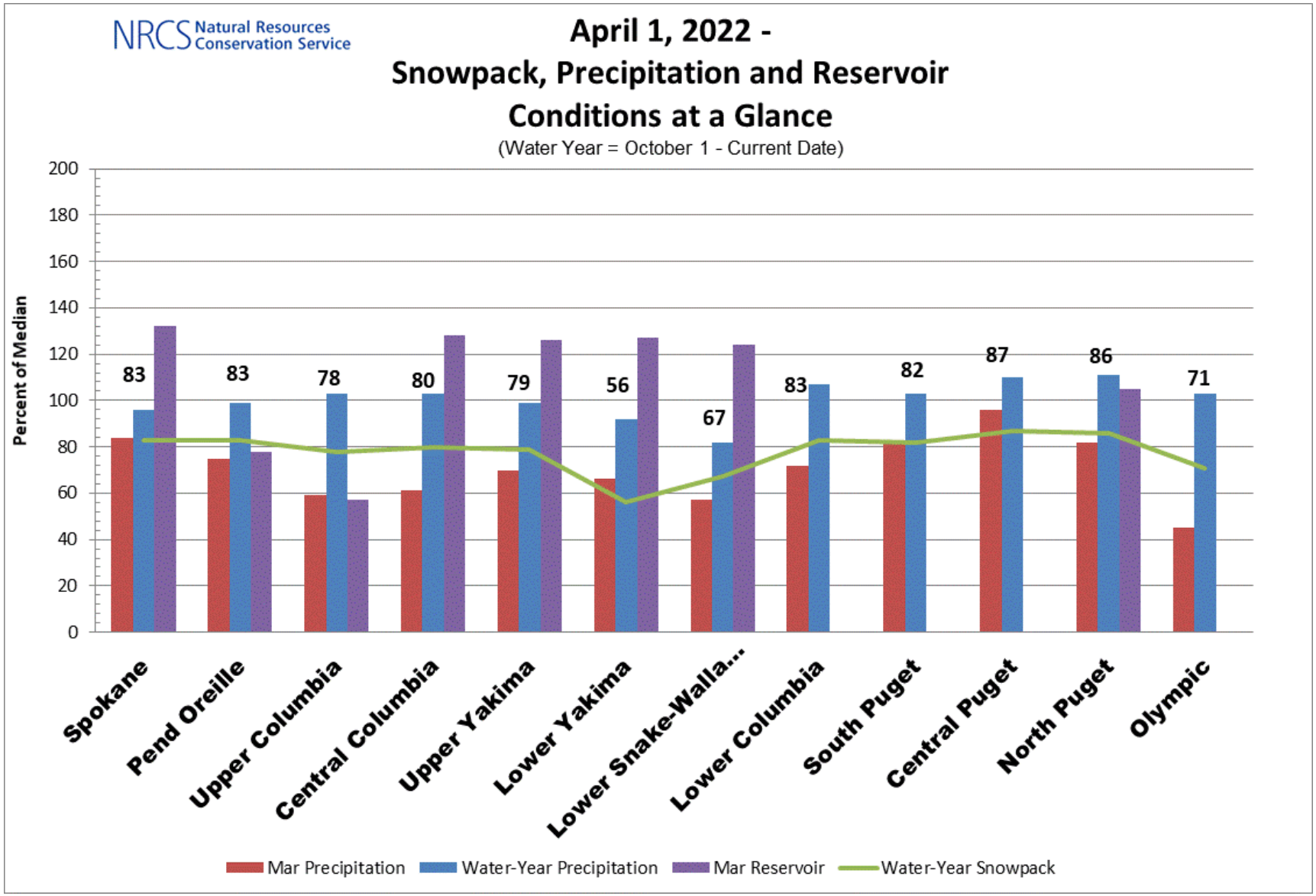
Idaho:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/

National Water and Climate Center (NWCC):
https://www.nrcs.usda.gov/wps/portal/wcc/home/

USDA-NRCS Agency Homepages

Washington:
https://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/

NRCS National:
https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/


NRCS Natural Resources Conservation Service
April 1, 2022 -
Snowpack, Precipitation and Reservoir
Conditions at a Glance
(Water Year = October 1 - Current Date)
Percent of Median
200
180
160
140
120
100
80
60
40
20
0
83
83
78
80
79
56
67
83
82
87
86
71
Spokane
Pend Oreille
Upper Columbia
Central Columbia
Upper Yakima
Lower Yakima
Lower Snake-Walla...
Lower Columbia
South Puget
Central Puget
North Puget
Olympic
Mar Precipitation
Water-Year Precipitation
Mar Reservoir
Water-Year Snowpack

89th Annual Western Snow Conference
April 18-21, 2022
Salt Lake City, Utah

"Drought, Fire, and Precipitation Extremes: Operational Challenges for Snow Water Resources"

Please plan to join us for the 89th Annual Meeting of the Western Snow Conference. The 2022 Meeting will be held at the University of Utah in Salt Lake City, April 18-21, 2022.

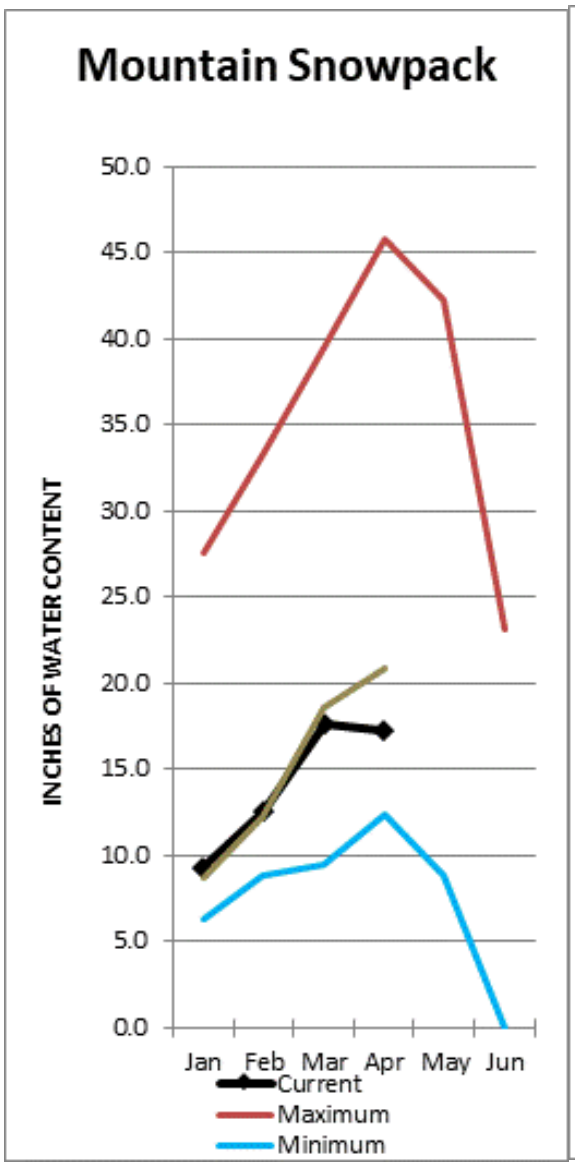
Agenda and registration details are now available on the conference webpage. A virtual option is once again available at a considerably reduced cost.

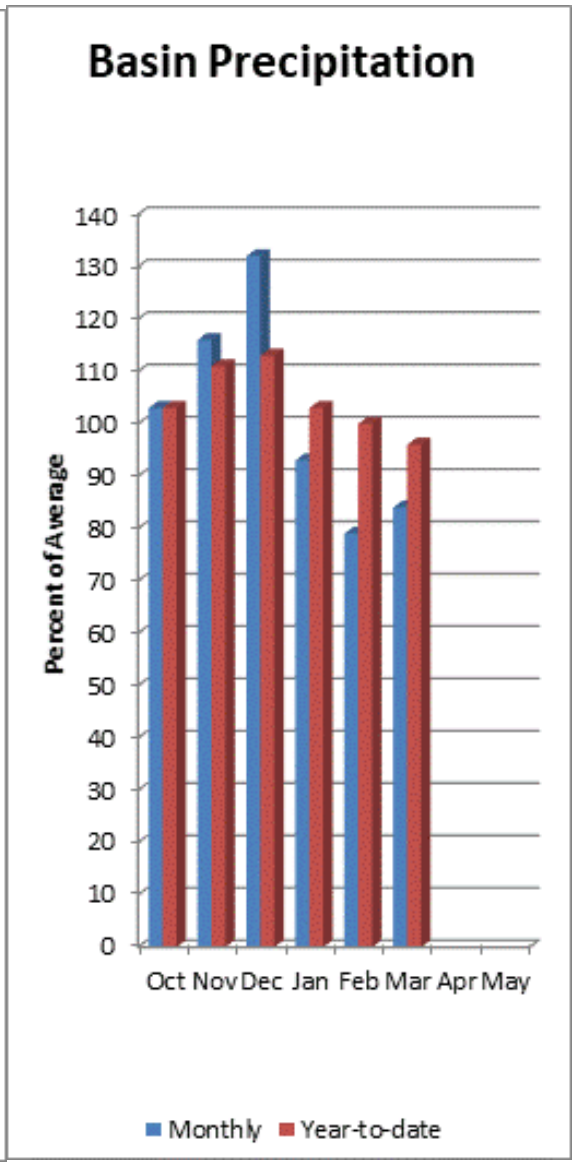
Noah Molotch — General Chair, WSC

McKenzie Skiles — Conference Chair

Additional information about the conference will be posted on the WSC web page at http://www.westernsnowconference.org/

Also find Western Snow Conference on Facebook





Basin snowpack is 83% of normal and precipitation is 96% of normal for the water year. Precipitation for March was 84% of normal. Reservoir storage is currently at 132% of normal.

For more information contact your local Natural Resources Conservation Service office.

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Spokane
Streamflow Forecasts - April 1, 2022

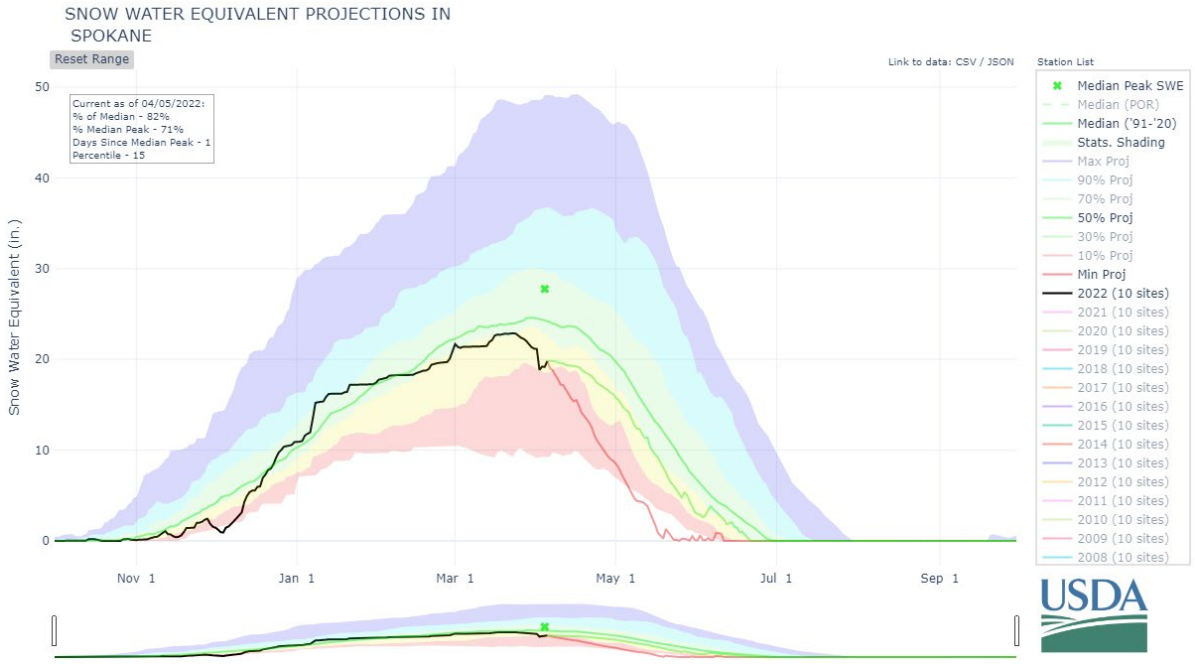
Spokane	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
		Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast						
Spokane R nr Post Falls[2]								
	APR-JUL	1570	1930	2180	87%	2420	2790	2510
	APR-SEP	1620	1990	2240	87%	2490	2870	2570
NF Coeur dAlene R at Enaville								
	APR-JUL	435	530	600	84%	665	765	715
	APR-SEP	460	565	630	84%	700	800	750
Chamokane Ck nr Long Lake								
	APR-JUL	5.8	9.2	12	83%	15.2	20	14.4
Spokane R at Long Lake[2]								
	APR-JUL	1810	2190	2440	90%	2700	3070	2720
	APR-SEP	1940	2340	2610	91%	2870	3270	2870
St. Joe R at Calder								
	APR-JUL	805	925	1010	96%	1090	1210	1050
	APR-SEP	855	980	1070	96%	1150	1270	1120

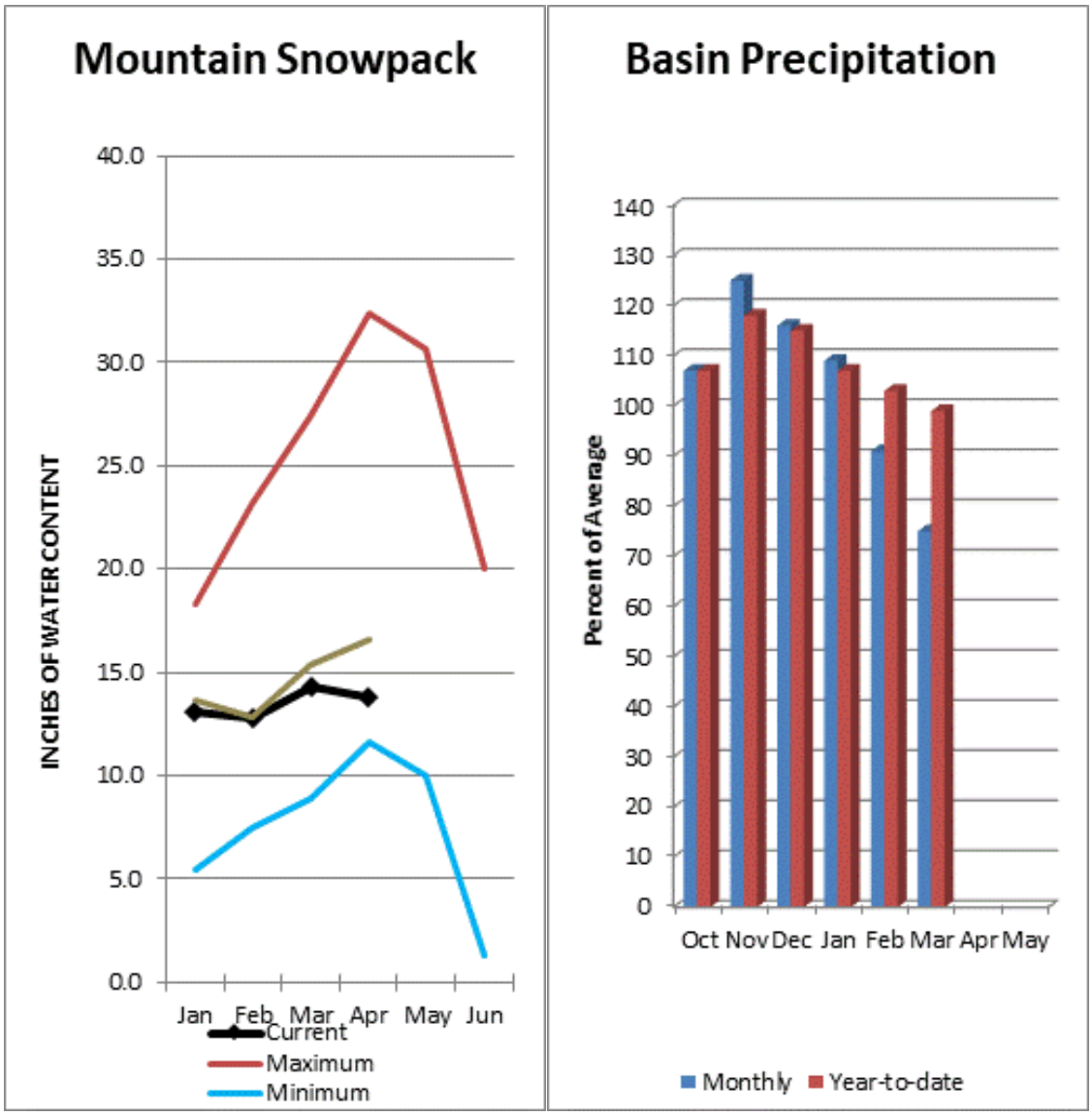
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Coeur d' Alene	203.1	114.1	153.8	238.5

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Spokane	21	83%	102%
Newman Lake	5	70%	114%





April 1 snow cover was 83% of normal in the Pend Oreille Basin River Basin and precipitation during March was 76% of normal, bringing the year-to-date precipitation at 99% of normal. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 78% of normal.

For more information contact your local Natural Resources Conservation Service office.

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Lower Pend Oreille
Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

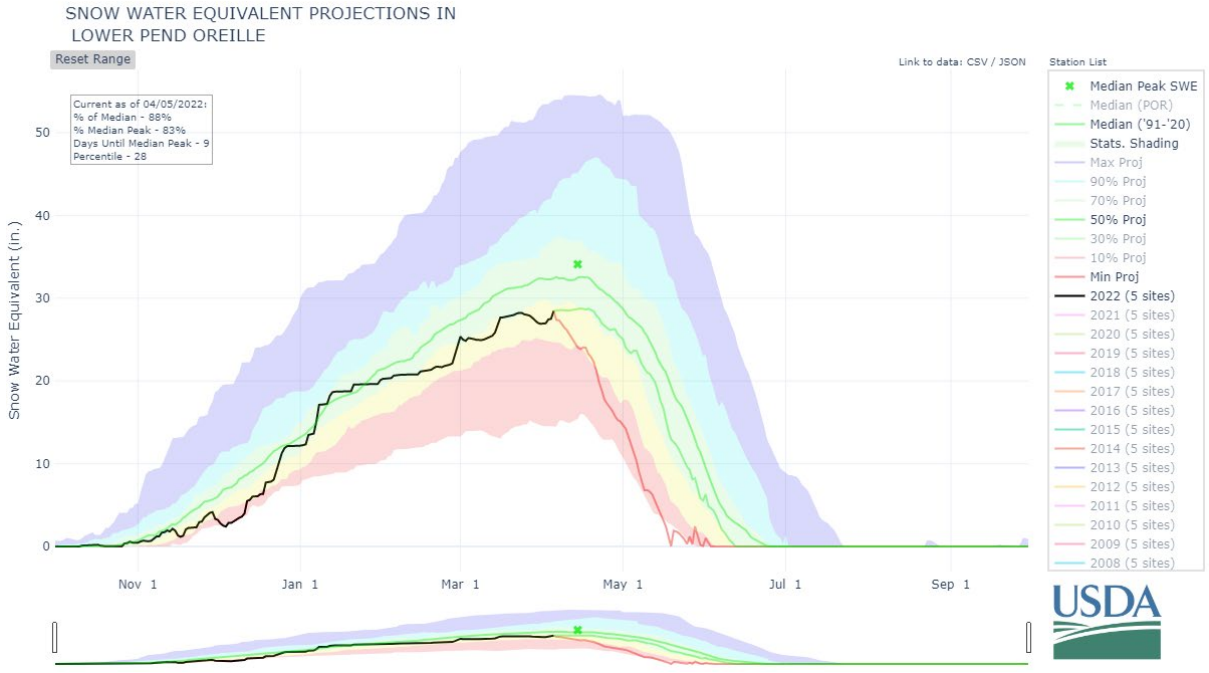
Lower Pend Oreille	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Priest R nr Priest River[2]								
	APR-JUL	540	645	715	85%	785	890	840
	APR-SEP	570	680	755	86%	830	940	880
Pend Oreille R bl Box Canyon[2]								
	APR-JUL	9820	11100	11900	102%	12700	14000	11700
	APR-SEP	10500	11900	12900	102%	13900	15300	12700
Pend Oreille Lake Inflow[2]								
	APR-JUL	9520	10800	11600	99%	12400	13700	11700
	APR-SEP	10200	11600	12500	99%	13400	14800	12600

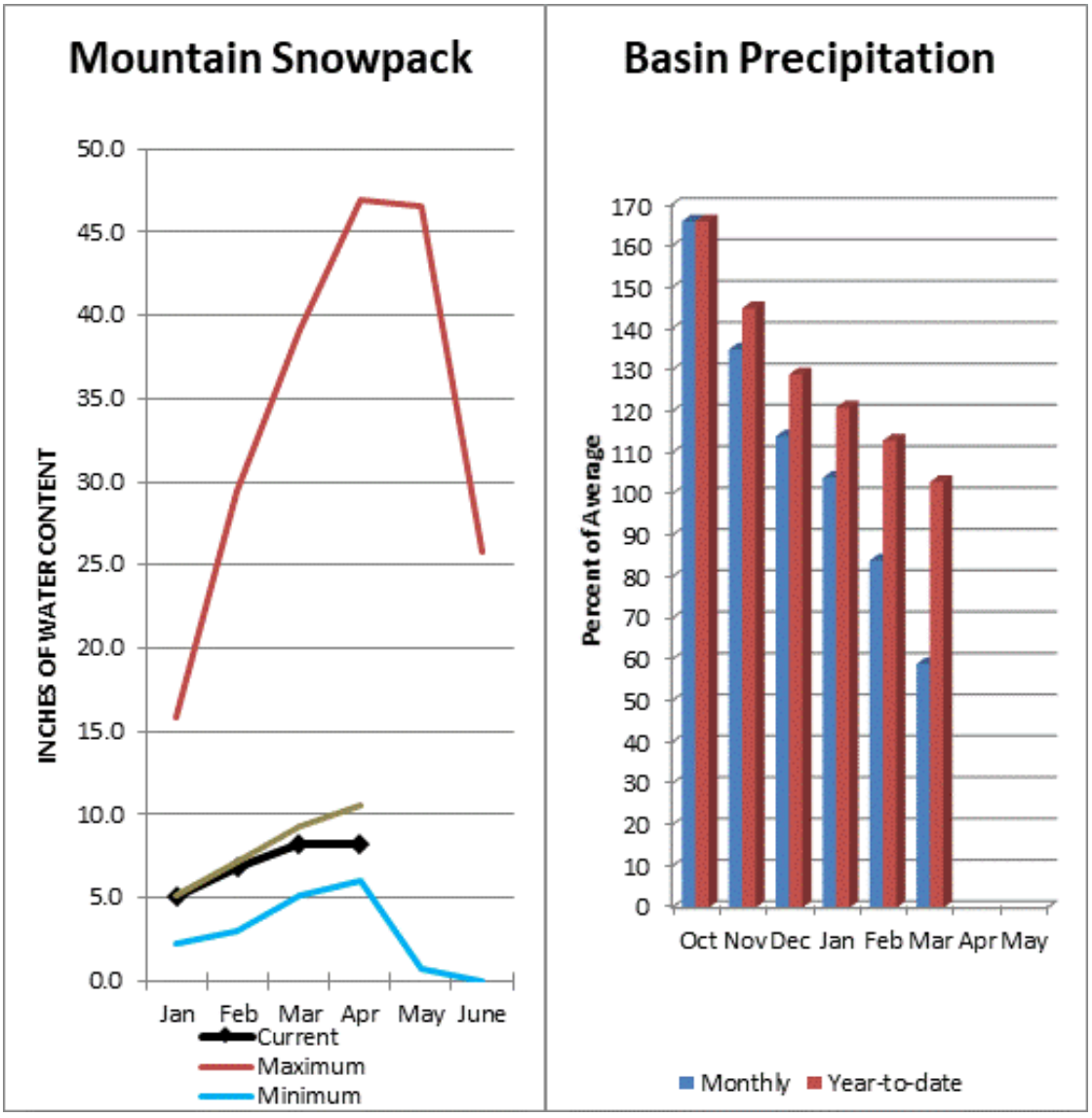
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Pend Oreille	577.9	593.6	755.3	1561.3
Priest Lake	61.1	45.2	64.4	119.3

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Lower Pend Oreille	14	83%	93%
Sullivan	1	77%	84%





April 1 snow cover on the Upper Columbia basins was 78% of normal and March precipitation was 59% of normal, with precipitation for the water year at 103% of normal. Combined storage in the Conconully Reservoirs was 57% of normal.

Upper Columbia River Basins

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Upper Columbia
Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

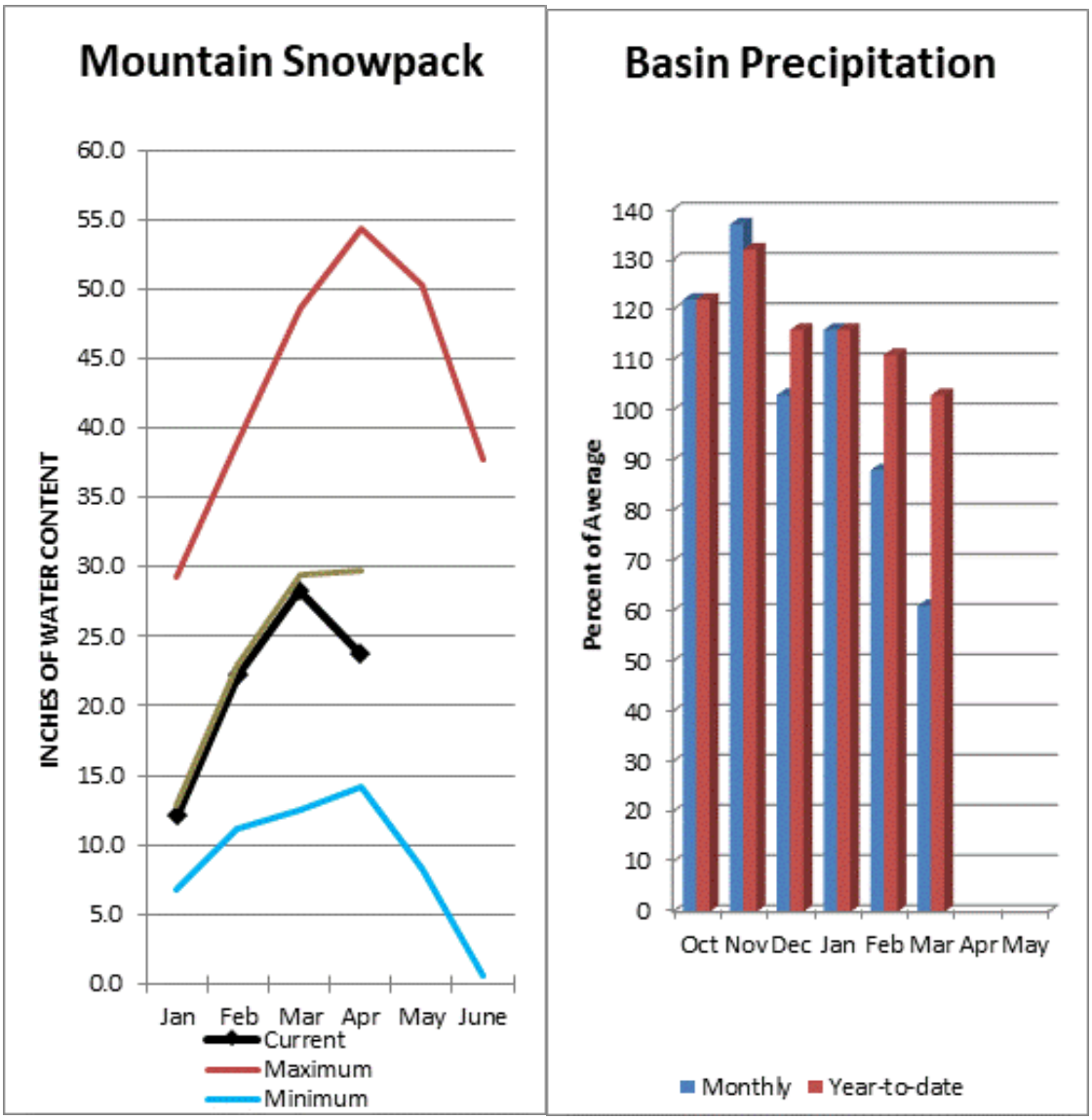
Upper Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Similkameen R nr Nighthawk								
	APR-JUL	1120	1260	1360	108%	1450	1600	1260
	APR-SEP	1190	1340	1440	107%	1540	1690	1340
Okanogan R at Malott								
	APR-JUL	1230	1420	1540	99%	1670	1850	1550
	APR-SEP	1340	1550	1700	101%	1840	2050	1680
Okanogan R nr Tonasket								
	APR-JUL	1200	1380	1510	99%	1630	1810	1520
	APR-SEP	1310	1520	1660	102%	1800	2010	1620
Columbia R at Grand Coulee-NWS[2]								
	APR-JUL	46700		55100	105%		66400	52600
	APR-SEP	54700		64800	107%		78700	60600
Colville R at Kettle Falls								
	APR-JUL	30	66	90	78%	115	150	115
	APR-SEP	34	73	100	81%	126	165	124
Methow R nr Pateros								
	APR-JUL	590	690	755	84%	825	925	895
	APR-SEP	645	750	820	85%	890	995	965
Kettle R nr Laurier								
	APR-JUL	1160	1400	1560	85%	1720	1950	1840
	APR-SEP	1200	1450	1620	83%	1790	2040	1950

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	3.5	5.6	7.9	10.5
Conconully Reservoir	6.0	5.6	8.8	13.0

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Upper Columbia	52	76%	105%
Toats Coulee	52	76%	105%
Sanpoil	4	40%	79%
Omak	3	39%	101%
Methow	10	81%	109%
Kettle	11	70%	103%
Concully Lake	3	42%	94%
Colville	2	80%	100%



April 1 snowpack in the Central Columbia River basins was 80% of normal. Precipitation during March was 61% of normal in the basin and 103% for the year-to-date. Reservoir storage in Lake Chelan was 128% of the median.

For more information contact your local Natural Resources Conservation Service office.

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Central Columbia
Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

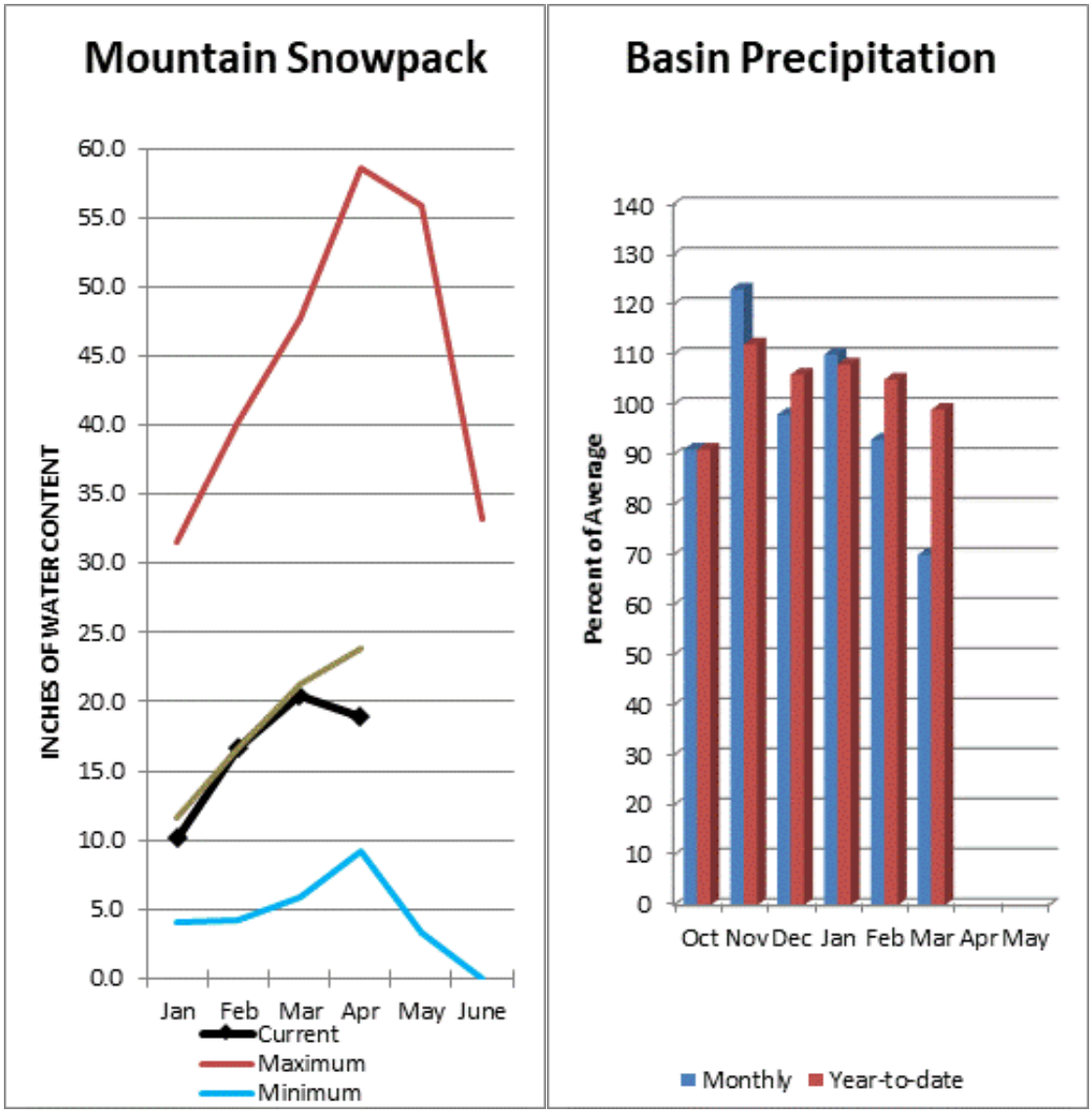
Central Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Chelan R at Chelan[2]								
	APR-JUL	785	875	930	89%	990	1080	1040
	APR-SEP	880	970	1030	88%	1100	1190	1170
Wenatchee R at Peshastin								
	APR-JUL	1110	1220	1290	90%	1360	1460	1440
	APR-SEP	1200	1310	1390	90%	1470	1590	1540
Icicle Ck nr Leavenworth								
	APR-JUL	215	245	265	91%	285	315	290
	APR-SEP	230	265	285	92%	310	340	310
Columbia R bl Rock Island Dam-NWS[2]								
	APR-JUL	50500		60300	105%		73200	57600
	APR-SEP	58900		70500	107%		86000	65800
Stehekin R at Stehekin								
	APR-JUL	540	600	635	89%	675	730	715
	APR-SEP	635	690	730	87%	765	825	835
Wenatchee R at Plain								
	APR-JUL	805	890	950	89%	1010	1090	1070
	APR-SEP	875	970	1030	89%	1100	1190	1160
Entiat R nr Ardenvoir								
	APR-JUL	140	164	181	82%	197	220	220
	APR-SEP	152	178	196	83%	215	240	235

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Chelan	293.3	206.2	228.8	677.4

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Central Columbia	12	80%	119%
Wenatchee	12	80%	119%
Stemilt	1	52%	89%
Lake Chelan	3	82%	108%
Entiat	1	60%	119%
Colckum	1	59%	114%



April 1 snowpack was 79% of normal. Precipitation was 70% of normal for March and 99% for the water-year. April 1 reservoir storage for the Upper Yakima reservoirs was 126% of normal.

Upper Yakima River Basin

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Upper Yakima
Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

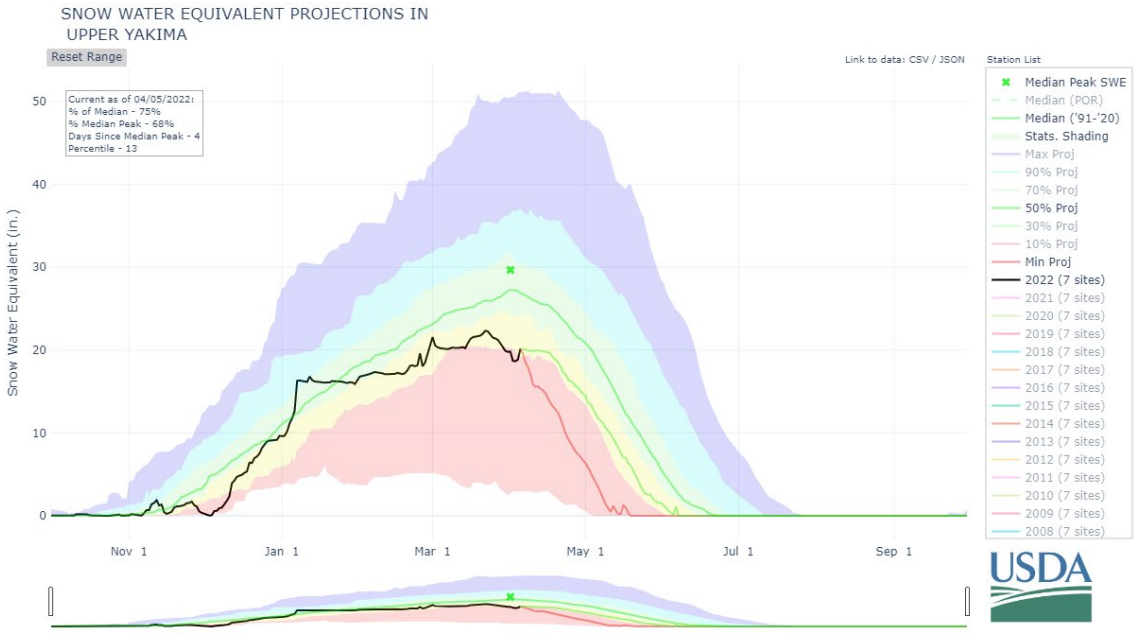
Upper Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Keechelus Reservoir Inflow[2]								
	APR-JUL	80	94	104	93%	113	127	112
	APR-SEP	89	104	114	90%	124	139	126
Kachess Reservoir Inflow [2]								
	APR-JUL	72	83	90	91%	97	108	99
	APR-SEP	80	92	99	92%	107	118	108
Teanaway R bl Forks nr Cle Elum								
	APR-JUL	78	99	112	85%	126	146	131
	APR-SEP	80	101	115	86%	129	150	134
Cle Elum Lake Inflow [2]								
	APR-JUL	290	320	340	88%	360	390	385
	APR-SEP	315	350	370	88%	390	425	420

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

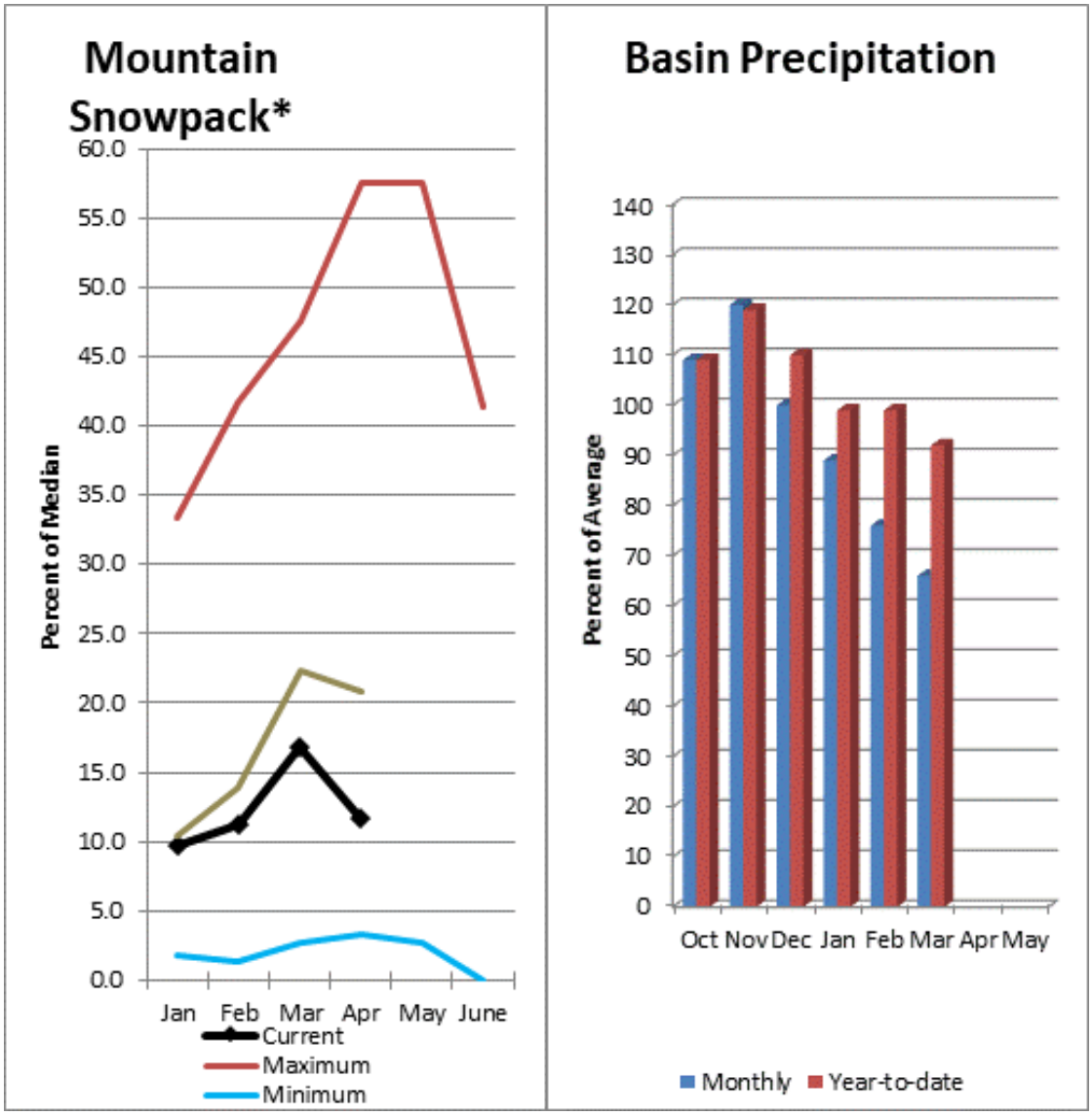
Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Kachess	217.6	174.8	172.4	239.0
Cle Elum	348.9	227.8	277.7	436.9
Keechelus	148.6	103.5	118.1	157.8

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Upper Yakima	10	79%	130%
Upper Yakima	10	79%	130%



For more information contact your local Natural Resources Conservation Service office.



April 1 basin snowpack was 36% of normal for the Lower Yakima and 55% and 76% respectively for the Klickitat and Naches basins. March precipitation was about 49% of normal and 92% for the water-year. April 1 reservoir storage for Bumping and Rimrock reservoirs was 127% of the median.

For more information contact your local Natural Resources Conservation Service office.

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Lower Yakima
Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Ahtanum Ck at Union Gap								
	APR-JUL	4.2	13.1	19.1	73%	25	34	26
	APR-SEP	6.1	15.1	21	75%	27	36	28
Yakima R nr Parker [2]								
	APR-JUL	1080	1280	1420	82%	1550	1750	1730
	APR-SEP	1200	1410	1550	82%	1690	1900	1890

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Lower Yakima	3	36%	84%
Simcoe-Toppenish	1	41%	108%
Satus	1	5%	40%
Ahtanum	2	56%	111%

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Naches
Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Naches	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Naches R nr Naches [2]								
	APR-JUL	460	560	625	87%	690	785	720
	APR-SEP	500	610	685	88%	755	865	775
Bumping Lake Inflow [2]								
	APR-JUL	78	91	100	88%	108	121	114
	APR-SEP	84	98	108	89%	118	132	122
Rimrock Lake Inflow [2]								
	APR-JUL	135	152	164	85%	175	192	194
	APR-SEP	161	181	194	83%	210	230	235
American R nr Nile								
	APR-JUL	71	82	90	90%	97	108	100
	APR-SEP	75	88	97	90%	105	118	108

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Bumping Lake	21.8	18.8	14.6	33.7
Rimrock	191.5	147.2	153.5	198.0

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Naches	9	76%	114%
Naches	9	76%	114%

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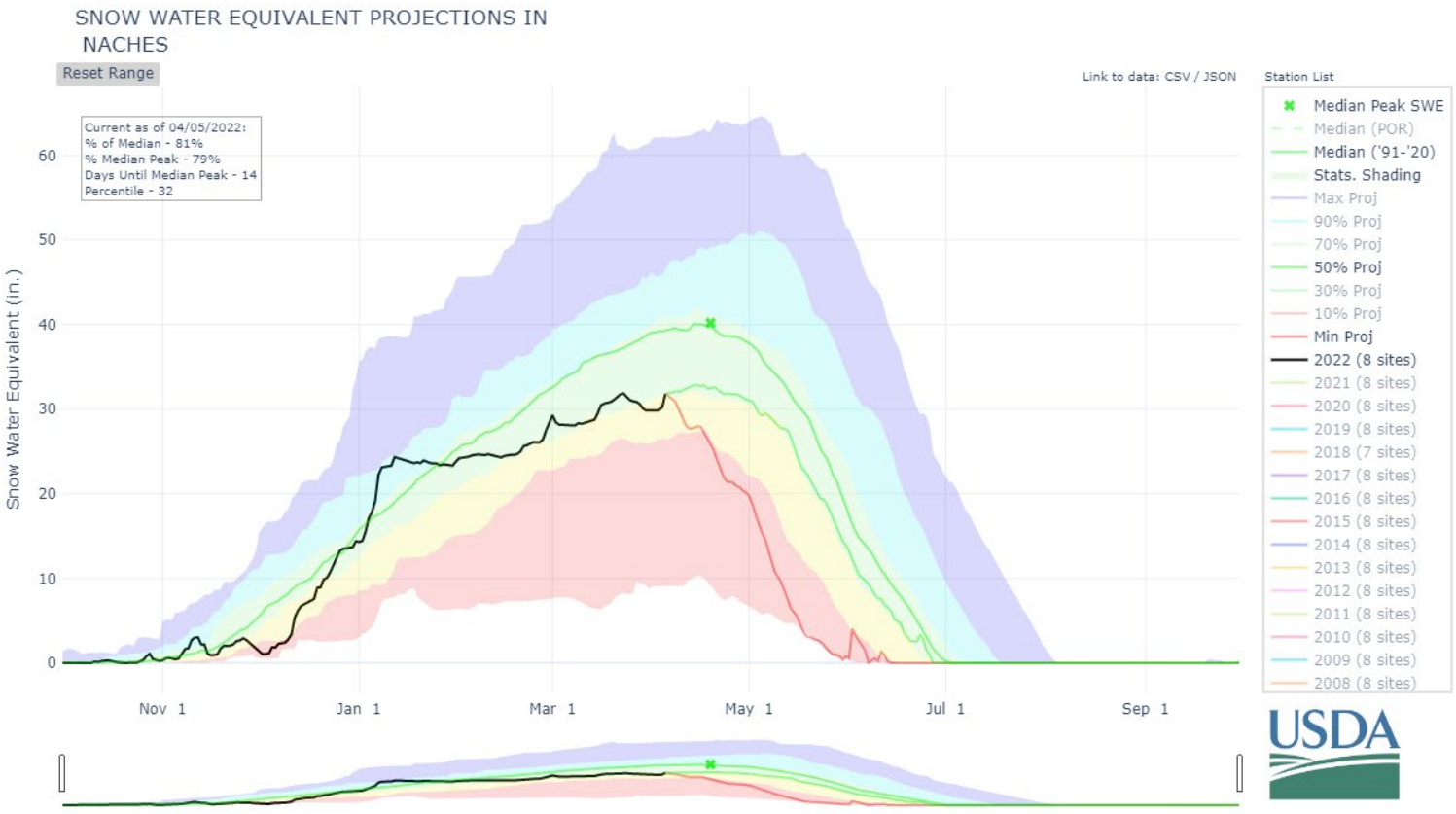
Klickitat
Streamflow Forecasts - April 1, 2022

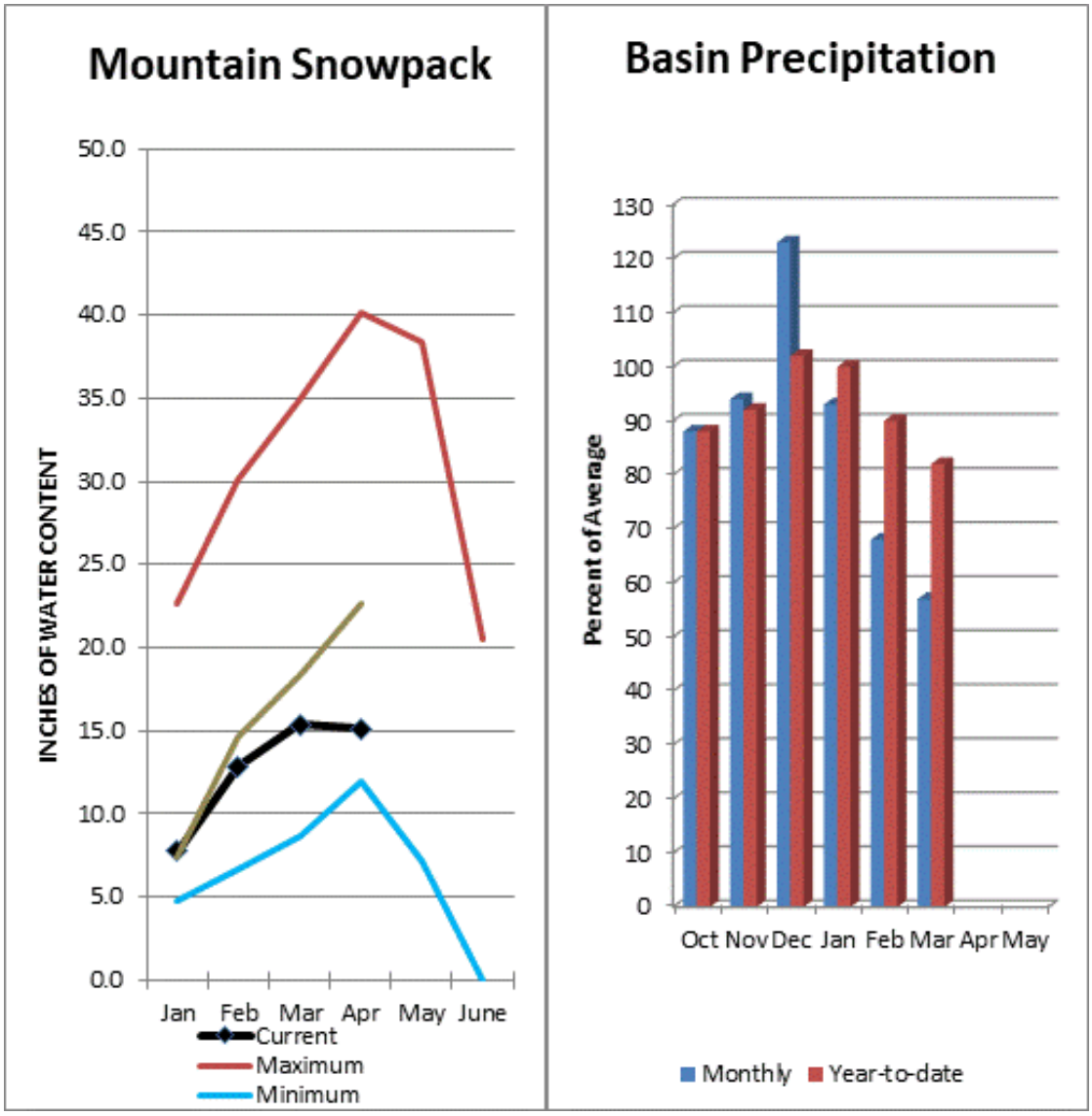
Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Klickitat	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Klickitat R nr Pitt								
	APR-JUL	265	335	380	84%	425	495	455
	APR-SEP	335	415	465	85%	515	590	545
Klickitat R nr Glenwood								
	APR-JUL	77	92	103	78%	114	130	132
	APR-SEP	85	102	114	79%	125	142	145

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Klickitat	4	53%	99%
Klickitat	4	53%	99%





April 1 snowpack readings were 67% of normal. March precipitation was 57% of normal, bringing the year-to-date precipitation to 82% of normal. Basin Reservoir storage was 124% of the median.

For more information contact your local Natural Resources Conservation Service office.

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Lower Snake-Walla Walla
Streamflow Forecasts - April 1, 2022

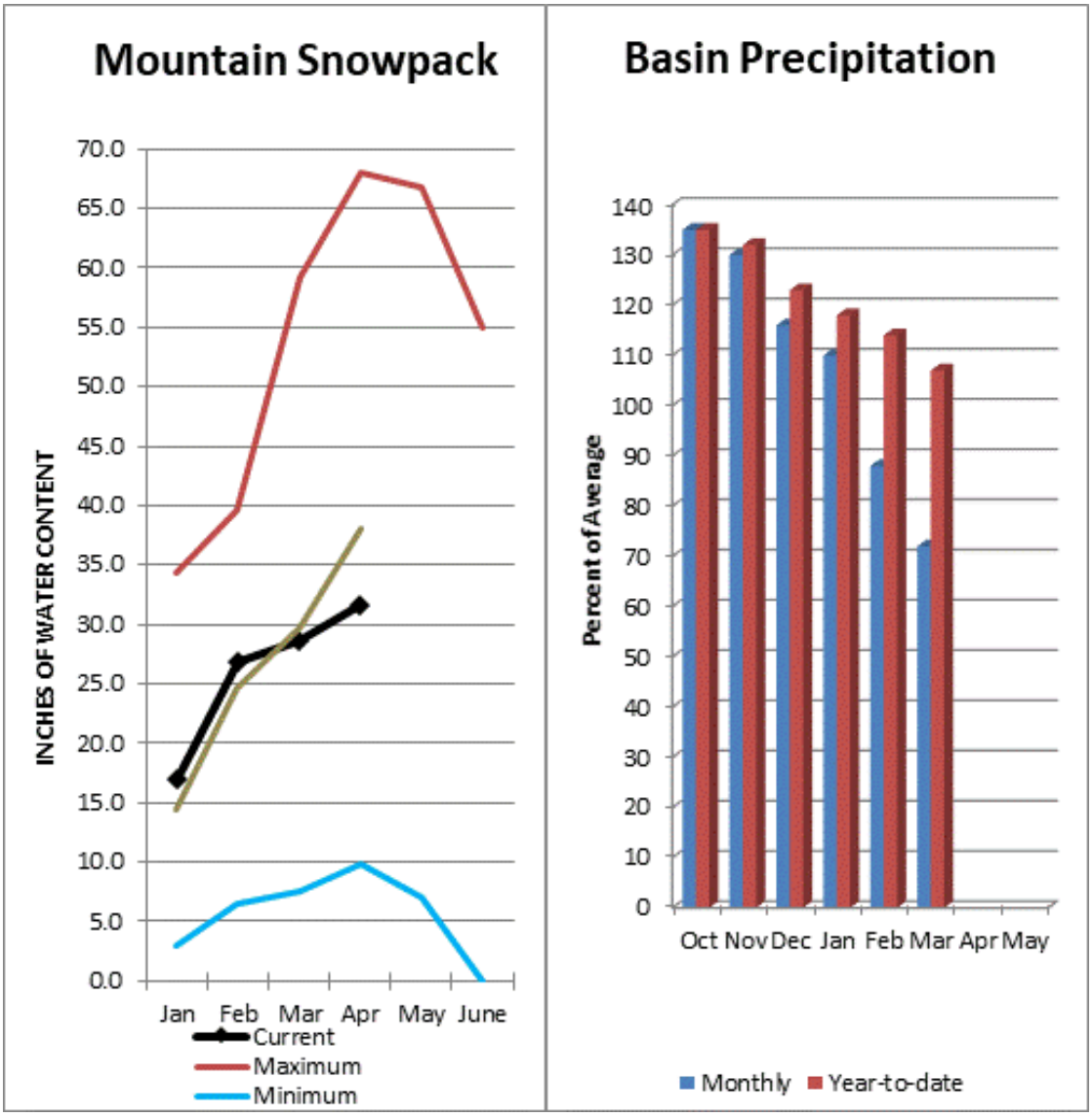
Lower Snake-Walla Walla	Forecast Period	Forecast Exceedance Probabilities For Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Mill Ck nr Walla Walla								
	APR-JUL	12.1	17.5	21	84%	25	30	25
	APR-SEP	15.5	21	25	86%	28	34	29
Asotin Ck at Asotin								
	APR-JUL	15.3	20	24	73%	28	34	33
SF Walla Walla R nr Milton-Freewater								
	APR-JUL	37	45	50	88%	55	62	57
	APR-SEP	49	57	62	89%	67	75	70
Snake R bl Lower Granite Dam-NWS[2]								
	APR-JUL	11400		14000	71%		18200	19700
	APR-SEP	13400		16200	74%		20700	21
								80
								0
Grande Ronde R at Troy								
	APR-JUL	600	780	895	70%	1020	1190	1270
	APR-SEP	660	840	960	71%	1080	1260	1350

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Wallowa Lake	22.7	19.0	18.4	37.5

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Lower Snake-Walla Walla	20	67%	118%
Walla Walla	5	74%	132%
Grande Ronde	18	66%	120%
Asotin	2	69%	147%



April 1 snow cover for Lower Columbia was 83% of normal. March precipitation was 72% of normal and the water-year was 107%.

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Lower Columbia
Streamflow Forecasts - April 1, 2022

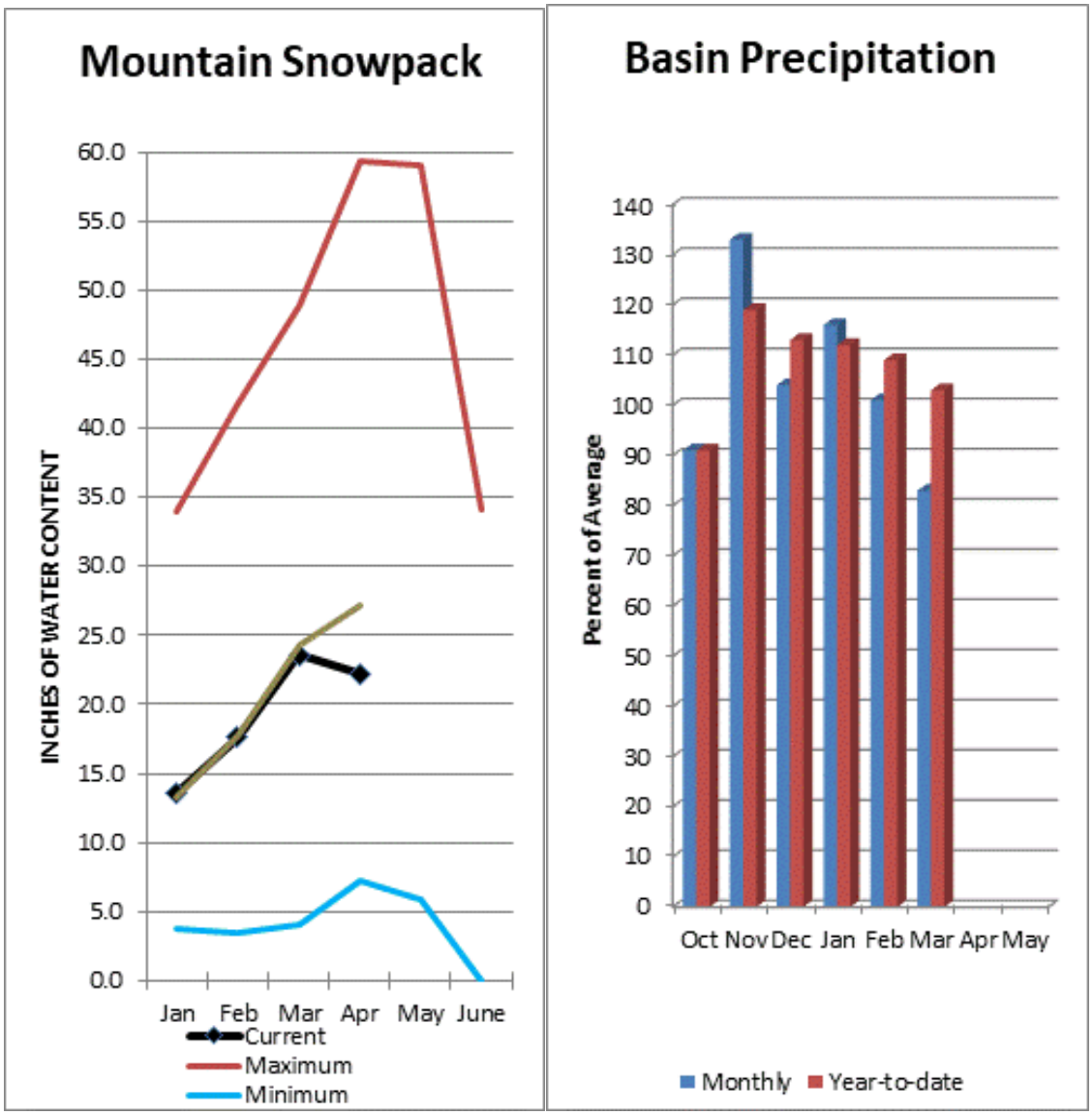
		Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast						
Lower Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Cowlitz R bl Mayfiled[2]								
	APR-JUL	1060	1280	1440	90%	1590	1810	1600
	APR-SEP	1230	1470	1630	91%	1790	2030	1790
Lewis R at Ariel								
	APR-JUL	685	845	950	92%	1060	1210	1030
	APR-SEP	810	975	1090	95%	1200	1360	1150
Cowlitz R at Castle Rock[2]								
	APR-JUL	1350	1730	1990	94%	2250	2630	2120
	APR-SEP	1520	1920	2190	94%	2460	2860	2330

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Mayfield		126.1	127.8	0.0
Merwin			396.4	0.0
Yale			365.2	0.0
Mossyrock Dam (Riffe Lk)		588.9	917.0	0.0
Swift			649.9	0.0

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Lower Columbia	15	83%	125%
Lewis	8	82%	129%
Cowlitz	9	82%	126%



April 1 snowpack was 82% of normal for the South Puget Sound. March precipitation was 83% of normal, bringing the water year-to-date to 103% of normal for the basins. Reservoir storage on the Green River was 119% of the median.

For more information contact your local Natural Resources Conservation Service office.

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South Puget Sound
Streamflow Forecasts - April 1, 2022

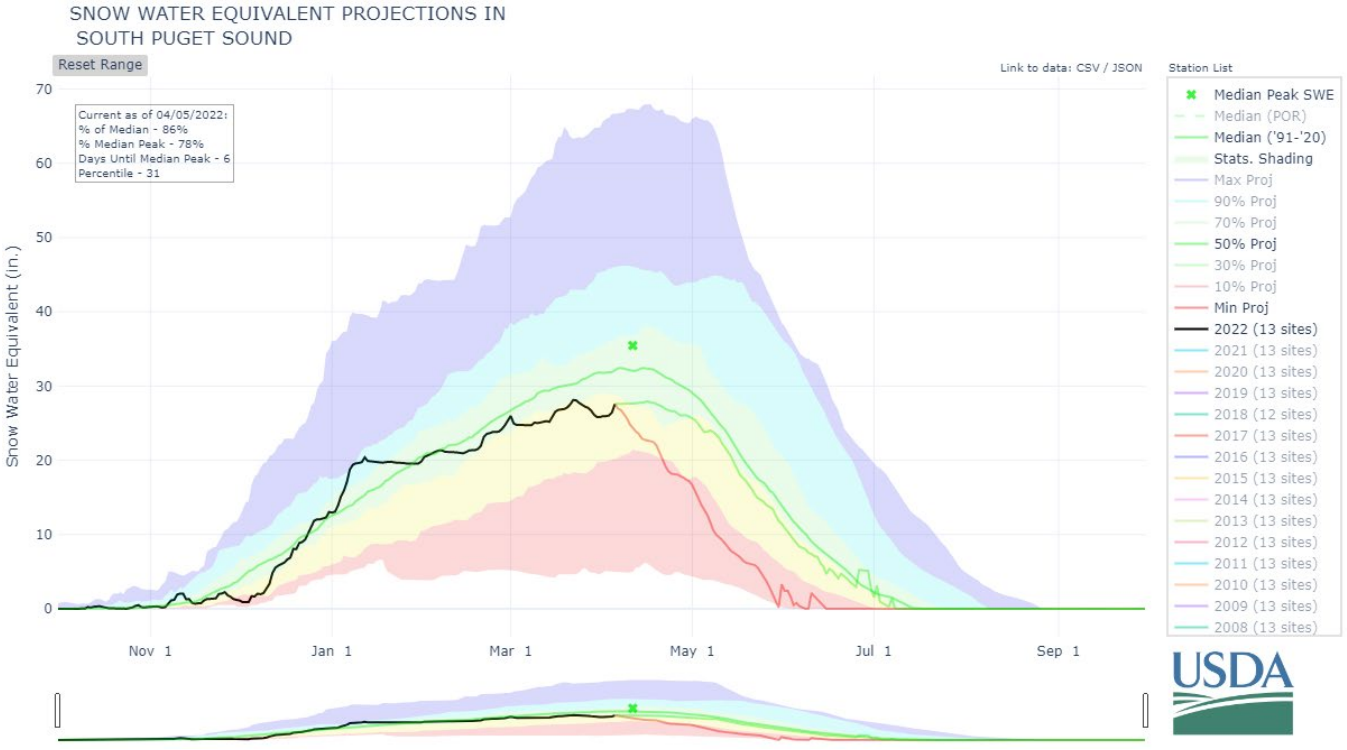
		Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast						
South Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
White R nr Buckley[11]								
	APR-JUL	300	370	405	94%	440	510	430
	APR-SEP	385	470	485	93%	545	630	520
Green R bl Howard A Hanson Dam[1]								
	APR-JUL	145	200	225	96%	250	305	235
	APR-SEP	161	220	245	96%	270	330	255

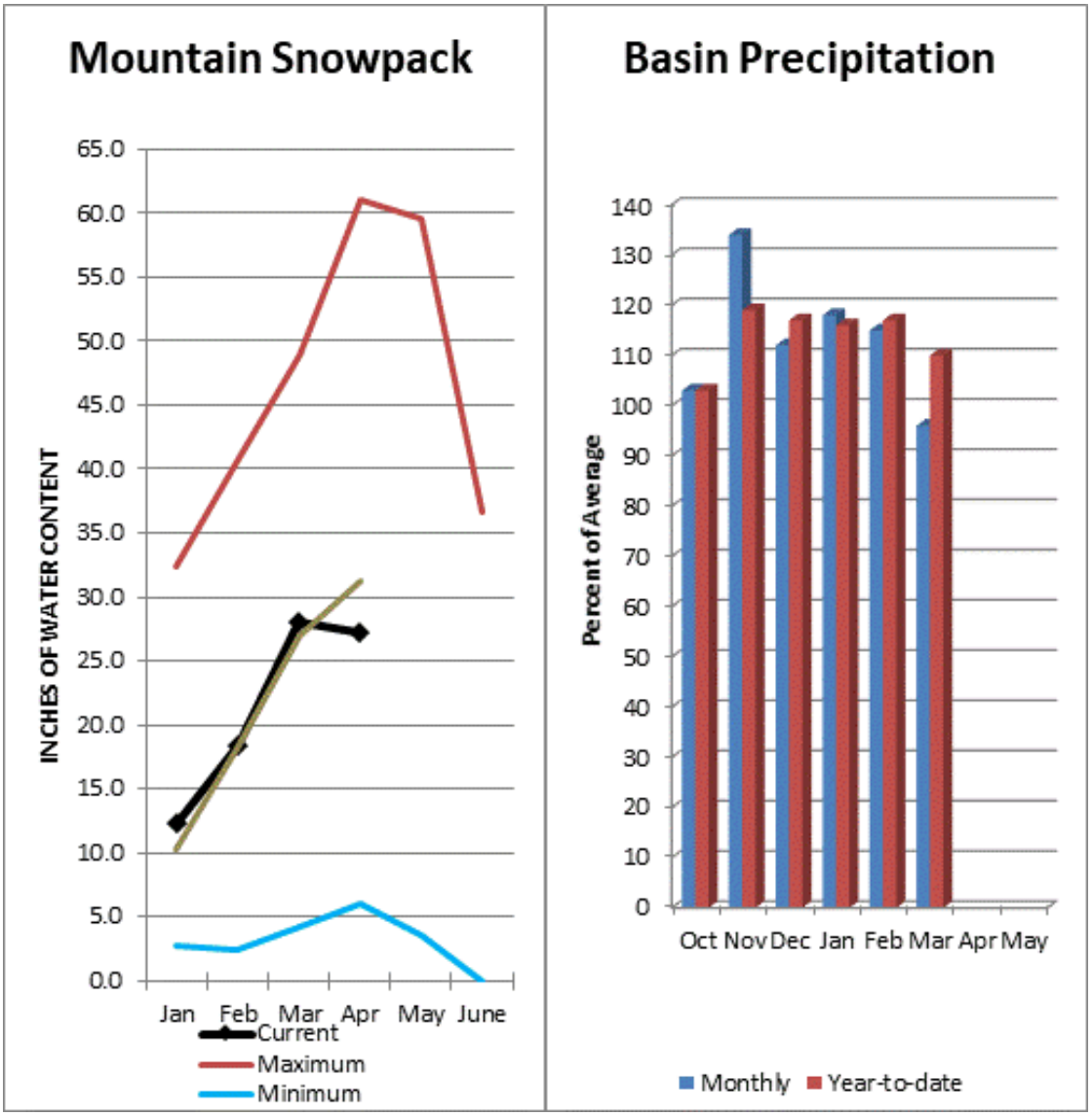
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Howard Hansen	16.5	18.2	13.9	0.0

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
South Puget Sound	13	82%	127%
White	5	80%	118%
Puyallup	2	95%	139%
Green	6	80%	141%





April 1 median snow cover in Central Puget Sound was 87%. Basin-wide precipitation for March was 96% of normal, bringing water-year-to-date to 110% of normal.

For more information contact your local Natural Resources Conservation Service office.

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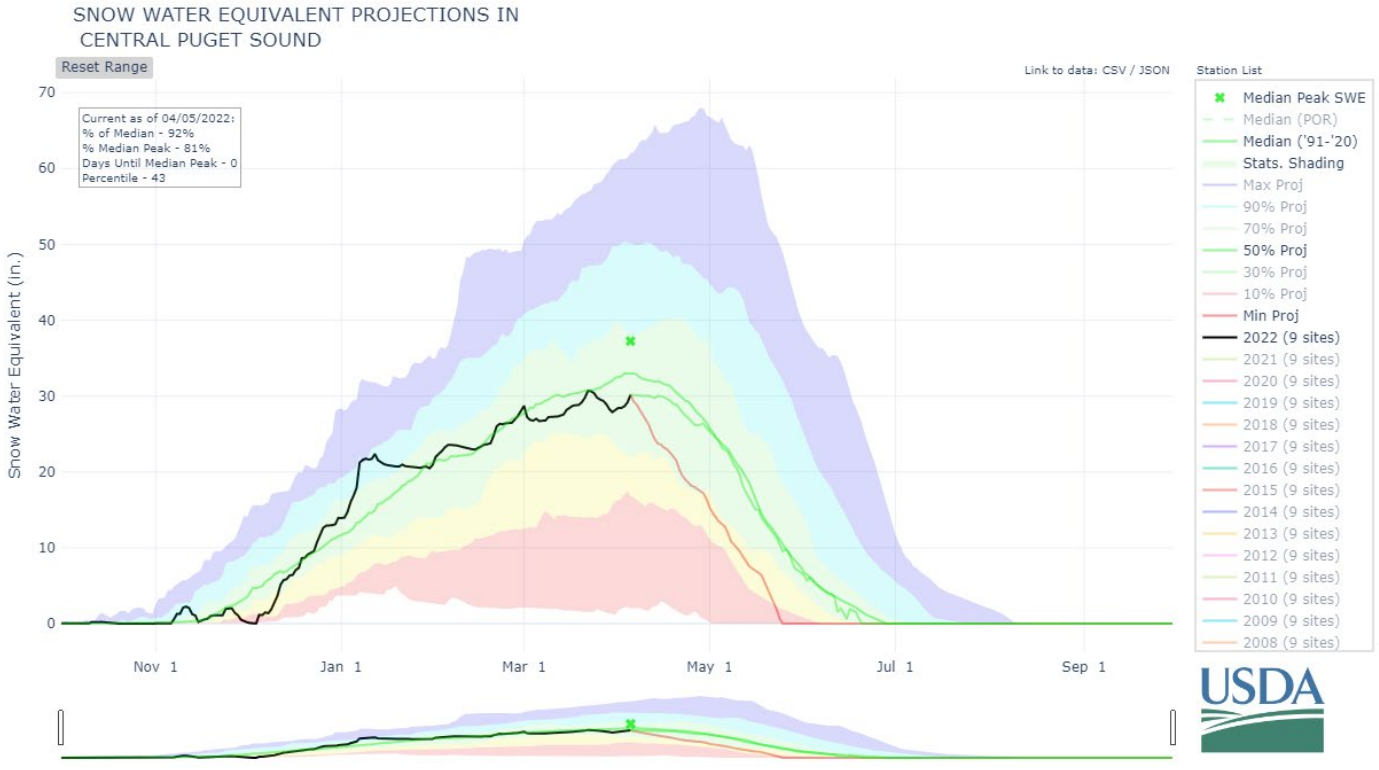
Central Puget Sound
Streamflow Forecasts - April 1, 2022

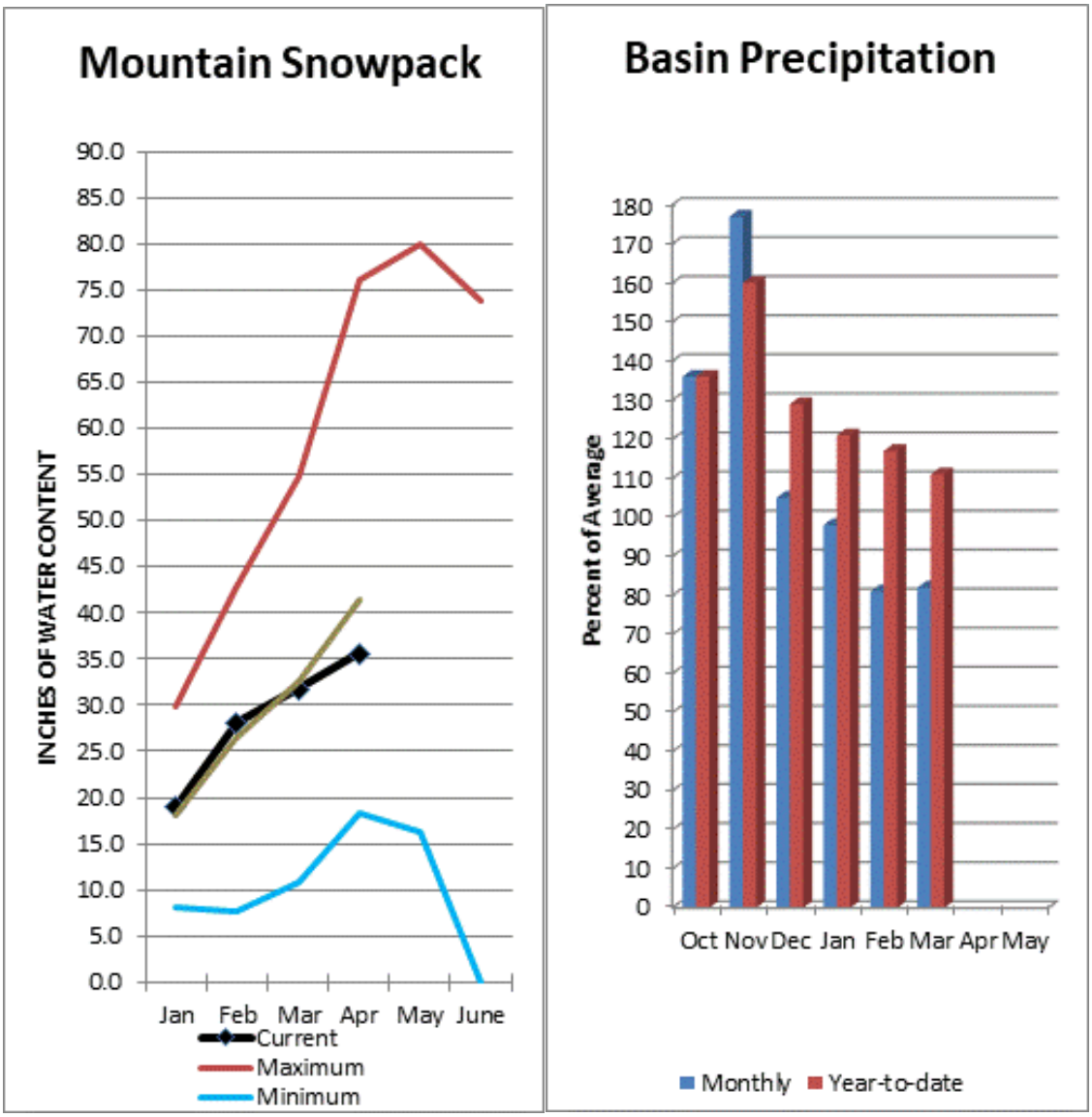
Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Central Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Taylor Ck nr Selleck								
	APR-JUL	16.3	19.1	21	100%	23	26	21
	APR-SEP	18.6	22	24	100%	26	29	24
Rex R nr Cedar Falls								
	APR-JUL	17	21	24	104%	26	30	23
	APR-SEP	18.1	23	26	100%	29	33	26
Cedar R nr Cedar Falls								
	APR-JUL	54	65	72	100%	80	91	72
	APR-SEP	58	70	78	101%	86	98	77
SF Tolt R nr Index								
	APR-JUL	10.1	12.4	14	104%	15.6	17.9	13.4
	APR-SEP	11.4	14.1	16	104%	17.9	21	15.4

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Central Puget Sound	9	87%	143%
Tolt	2	90%	154%
Snoqualmie	4	87%	143%
Skykomish	3	93%	153%
Cedar	6	83%	136%





April 1 median snow cover in North Puget Sound was 87%. Basin-wide precipitation for March was 82% of normal, bringing water-year-to-date to 111% of normal. April 1 Basin-wide reservoir storage was 105% of normal.

For more information contact your local Natural Resources Conservation Service office.

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North Puget Sound
Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

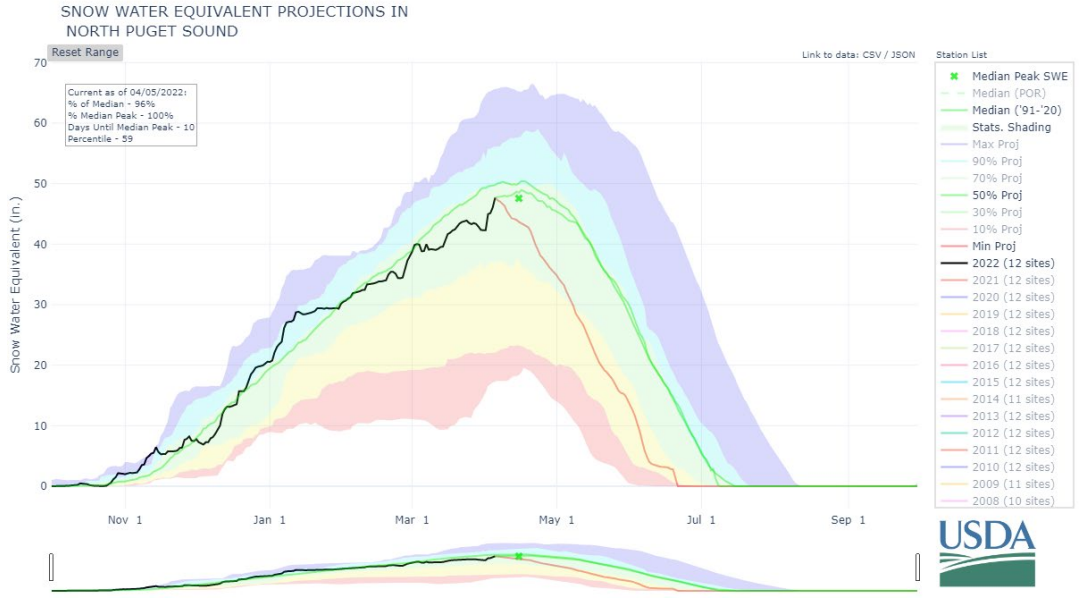
North Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Baker R at Concrete								
	APR-JUL	640	705	750	97%	795	860	770
	APR-SEP	830	905	960	97%	1010	1090	990
Skagit R at Newhalem								
	APR-JUL	1540	1630	1700	98%	1770	1860	1740
	APR-SEP	1810	1930	2010	100%	2090	2200	2020
Thunder Ck nr Newhalem								
	APR-JUL	200	220	230	96%	245	265	240
	APR-SEP	285	310	325	98%	340	360	330

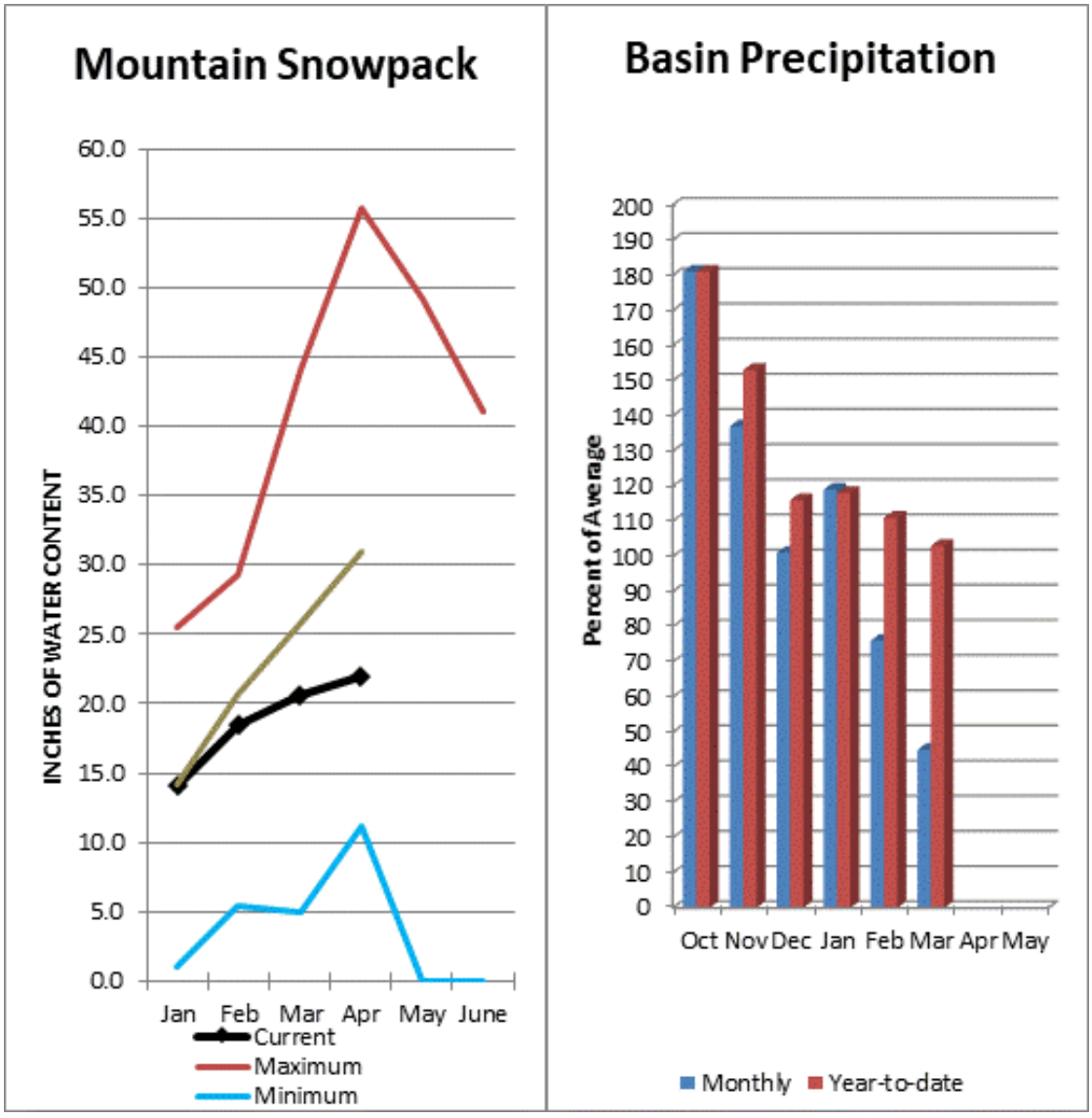
1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Upper Baker	104.6	89.1	104.6	0.0
Gorge Reservoir			7.9	0.0
Diablo Reservoir			85.7	90.6
Lake Shannon	92.2	61.7	63.3	0.0
Ross	718.9	559.8	703.5	1434.7

Basin Index
# of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
North Puget Sound	19	86%	109%
Skagit	13	90%	108%
Nooksack	3	74%	118%
Baker	2	90%	109%





Snowpack averaged 71% of normal on April 1. March precipitation was 45% of normal. Precipitation has accumulated at 103% of normal for the water year. March precipitation at Quillayute was 85% of normal, Sequim was 43% and Forks reported 70%.

For more information contact your local Natural Resources Conservation Service office.

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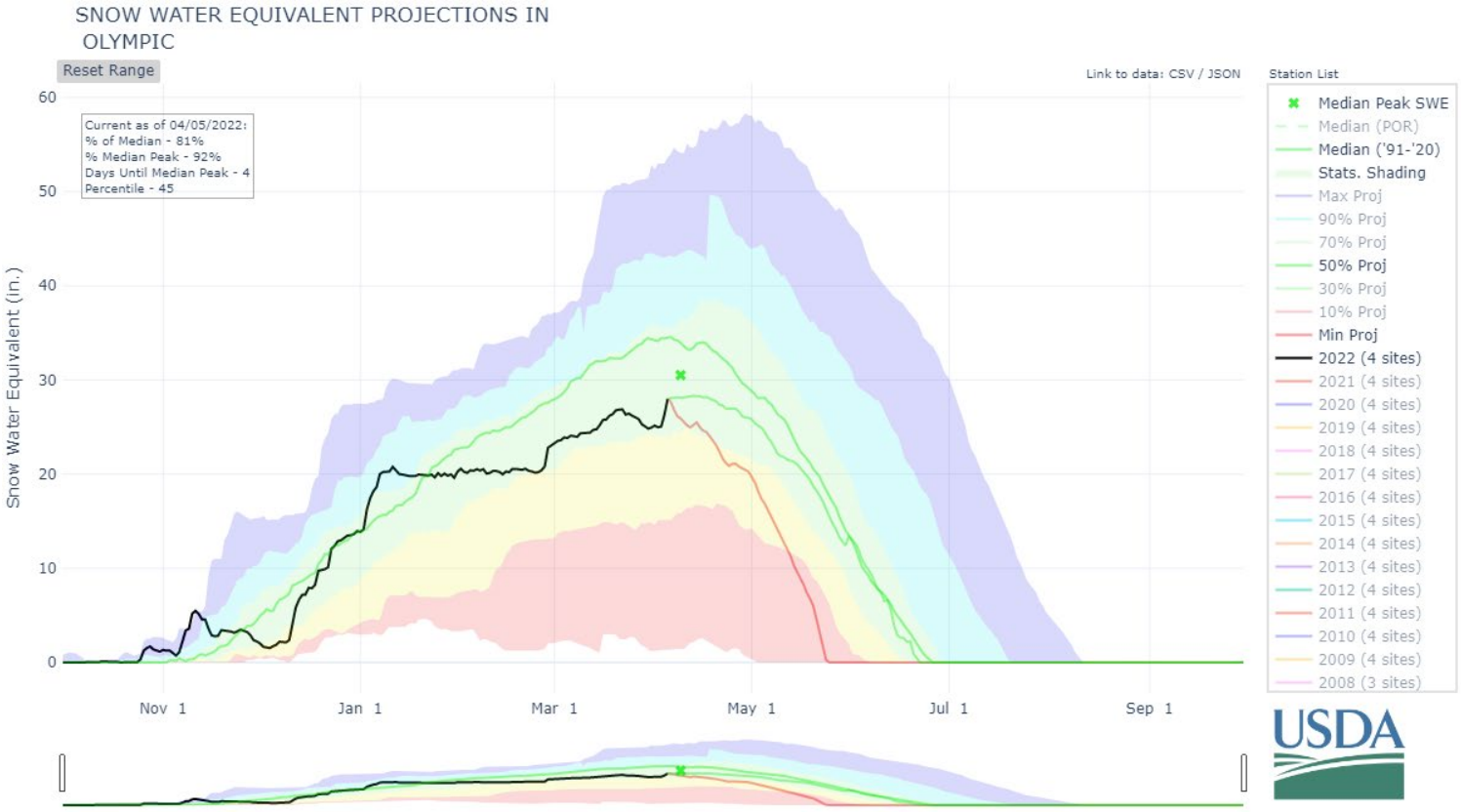
Olympic
Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Olympic	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Elwha R at McDonald Br nr Port Angeles								
	APR-JUL	260	300	325	88%	350	385	370
	APR-SEP	315	355	380	85%	410	450	445
Dungeness R nr Sequim								
	APR-JUL	82	92	99	83%	106	116	119
	APR-SEP	94	107	116	83%	125	138	139

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Olympic	7	71%	126%
Olympic	7	71%	126%



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Terry Cosby	**Roylene Comes-At-Night**
Acting Chief	**State Conservationist**
Natural Resources Conservation Service	**Natural Resources Conservation Service**
U.S. Department of Agriculture	**Spokane, Washington**

The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Snow Survey Network Program – British Columbia Ministry of Environment
	River Forecast Center – British Columbia Ministry of Forests, Lands and Natural Resource Operations
State	Washington State Department of Ecology
	Washington State Department of Natural Resources
	Washington State Fish and Wildlife
Federal	Department of the Army, Corps of Engineers
	U.S. Department of Agriculture, Forest Service
	U.S. Department of Commerce, NOAA, National Weather Service
	U.S. Department of Interior
	Bonneville Power Administration
	Bureau of Reclamation
	Geological Survey
	National Park Service
	Bureau of Indian Affairs
	U.S. Fish and Wildlife Service
Local	City of Tacoma
	City of Seattle
	City of Bellingham
	Chelan County P.U.D.
	Pacific Power/PacificCorp
	Puget Sound Energy
	Washington Water Power Company
	Snohomish County P.U.D.
	Colville Confederated Tribes
	Spokane County
	Yakama Indian Nation
	Whatcom County
	Pierce County
	Kalispel Tribe of Indians
	Spokane Indian Tribe
	Jamestown S'Klallam Tribe
	Sauk-Suiattle Tribe of Indians
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Private	Okanogan Irrigation District
	Wenatchee Heights Irrigation District
	Newman Lake Homeowners Association
	Whitestone Reclamation District
	Kinross Mining

***Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.**

Washington Snow Survey Office
2005 E. College Way, Suite 203
Mount Vernon, WA 98273-2873

Washington Water Supply Outlook Report

Natural Resources Conservation Service
Spokane, WA